Solution by A. M. HARDING, Fayetteville, Arkansas.

It can easily be shown that

$$\int_0^\infty e^{-bx}\cos bm\,db = \frac{x}{m^2+x^2}; \quad \int_0^\infty e^{-bx}\sin bm\,db = \frac{m}{x^2+m^2}$$

$$\text{and } 2\int_0^\infty be^{-b^2(1+x^2)}db = \frac{1}{1+x^2}.$$

Hence $u = \int_0^\infty \frac{x\sin ax}{1+x^2}dx = \int_0^\infty \sin ax\left(\int_0^\infty e^{-bx}\cos bdb\right)dx.$

$$\therefore \frac{du}{db} = \int_0^\infty \sin axe^{-bx}\cos bdx = \cos b\int_0^\infty e^{-bx}\sin axdx = \cos b.\frac{a}{a^2+b^2}.$$

$$\therefore u = \int_0^\infty \frac{a\cos b}{a^2+b^2}db, \text{ putting } ax \text{ for } b, = \int_0^\infty \frac{\cos ax}{1+x^2}dx.$$

$$\therefore \int_0^\infty \frac{x\sin ax}{1+x^2}dx = \int_0^\infty \frac{\cos ax}{1+x^2}dx.$$

Now $u = \int_0^\infty \frac{\cos ax}{1+x^2}dx = \int_0^\infty \cos ax\,(2\int_0^\infty be^{-b^2(1+x^2)}db)\,dx.$

$$\frac{du}{db} = 2\int_0^\infty \cos ax.be^{-b^2(1+x^2)}dx = 2\,be^{-b^2}\int_0^\infty e^{-b^2x^2}\cos ax\,dx = 2be^{-b^2}.\frac{\sqrt{\pi}}{2b}e^{-(a^2/4b^2)}$$

(see Byerly's *Integral Calculus*, Art. 93 (b))

$= \sqrt{(\pi)}e^{-b^2-[(a/2)^2/b^2]}$. $\quad u = \sqrt{(\pi)}\int_0^\infty e^{-b^2-[(a/2)^2/b^2]}db = \sqrt{(\pi)}.e^{-a}.\frac{\sqrt{\pi}}{2} = \frac{\pi}{2}e^{-a}.$

(Art. 93 (a)).

Also solved by J. Scheffer, S. A. Corey, and the Proposer.

NOTES AND NEWS.

Professor Cajori's *Theory of Equations*, which was published in 1904, was reprinted by the Macmillan Company during last January. M.

The spring meeting of the Chicago section of the American Mathematical Society will be held at Chicago on Friday and Saturday, April 5 and 6, 1912. S.

The third number of the *Tohoku Mathematical Journal*, published at Sendai, Japan, appeared during last January. It contains seven articles, of which six are in English while the remaining one is in German. A volume composed of four numbers, is sold for one dollar. M.

The Department of Superintendence of the National Education Association held its annual meeting in St. Louis, on February 27, 28, and 29, 1912. Many interesting questions are found on its program and on those of the various educational societies which met in St. Louis during the same week. S.

The remaining two volumes of the second edition of Pascal's *Repertorium der hoeheren Mathematik* are now expected to appear toward the end of the present year. It may be remembered that three successive circulars issued by B. G. Tuebner, of Leipzig, announced that these volumes would appear in the spring and summer of 1911 and at Easter of 1912. M.

During last September the University of Illinois published a list of serials in the university library. This includes newspapers, magazines, periodicals, and serial publications of societies, corporations, institutions, and governmental bodies. These serials have appeared under more than 8000 different titles and 215 of them are classified under mathematics, astronomy, or physics. M.

In an interesting article on non-euclidean geometry in the current number of the *Bulletin of the American Mathematical Society*, it is found by actual count that of all who have ever written on non-euclidean geometry, Dr. Halsted has the most titles to his credit, seventy-seven with his translations, which with his biography of Sommerville bring the count up to ninety-two. F.

The North Central Association of Schools and Colleges will hold its annual meeting at the Auditorium Hotel in Chicago on Friday and Saturday, March 22 and 23, 1912. An important report on the accrediting of schools will be presented by a committee of which President Hill, of the University of Missouri, and Director Judd, of the University of Chicago School of Education, are members. S.

The annual conference of the University of Chicago with its coöperating schools, which for twenty years has been held in November, will this year be held in April. The date was changed in order to give the representatives of secondary schools time to visit the junior college work of the university which they have been doing all the autumn and winter. The programme of the conference will be based upon the reports of their visitations from the schools to the university, thus reversing the usual order of procedure. S.

At the University of Illinois the following mathematical courses, beyond a first course in calculus, are now being given: Functions of a Complex variable, Professor Townsend; Theory of Numbers and Theory of Equations, Professor Miller; Theory of Statistics, Professor Rietz; Solid Analytic Geometry, Professor Sisam; Theory of Potential, Professor Shaw; Projective Geometry and Linear Transformations, Professor Emch; Functions of a Real Variable, Dr. Crathorne; Partial Differential Equations, Dr. Wahlin; Advanced Calculus, Dr. Lytle. M.

The Edinburgh Mathematical Society is publishing a brief review of elementary mathematics and science, entitled *Mathematical Notes.* The series began in April, 1909, and the nine numbers which have appeared cover 108 pages in all. No. 9 was issued in January, 1912, and contains four short papers entitled respectively: "Logarithms and the Reciprocals of Numbers; Certain Processes in the Theory of Equations Illustrated Geometrically; The Arithmetic Mean of a Number of Real Positive Numbers is not Less than Their Geometric Mean; Additional Notes on the Right-Angled Triangle. All contributions and communications referring to these notes should be addressed to P. Pinkerton, George Watson's College, Edinburgh, Scotland." M.

The sixth number of the journal published by the new Spanish Mathematical Society under the title *Revista de la Sociedad Matematica Espanola* appeared during last February. In addition to the usual articles this number contains a list of the 423 members of this young and active society. From this list it appears that the Spanish speaking countries of America are, as yet, too poorly represented in this society. As the articles appearing in the "Revista" are quite elementary and represent a number of different interests, it is to be hoped that this journal will serve to awaken a more general mathematical interest in the countries which employ the Spanish language, and that it may soon find more hearty support from this side of the Atlantic. M.

The provisional report of the national committee of fifteen on Geometry Syllabus, which was presented at the San Francisco meeting of the National Education Association, in July, 1911, and also of the meeting of the American Federation of the Teachers of the Mathematical and Physical Sciences, held in Washington in December, 1911, has since been revised by the committee in the light of many helpful suggestions received from many sources, and a large edition has been issued for general distribution. Copies will soon be mailed to those who are members of the associations belonging to the Federation. Others who desire copies may secure them *gratis* upon application to the Commissioner of Education, Department of the Interior, Washington, D. C., to whom a large number has been donated for general distribution. S.

In connection with the large French Mathematical Encyclopedia there is being published a "Tribune Publique" devoted to corrections and additions relating to the parts of this great work which have been issued. The entire mathematical world is invited to help in this way toward making this work more complete and more reliable. In 1904 G. Enestroem called attention, in the Bibliotheca Mathematica, page 398, to the usefulness of such general coöperation and to the fact that it is important to omit reference to useless or unreliable articles, as well as to give reference to all articles, which advance the subject in hand. It is to be hoped that the "Tribune publique" will receive more and more general support and that an increasing number of mathematicians will realize the dignity and importance of assisting, even in this humble manner, in this useful but colossal enterprise.
M.

From the 9th to the 15th of October, 1911, vacation courses were offered at Zurich, Switzerland, for the benefit of all the secondary teachers of Switzerland. There were 520 in attendance and forty-eight different courses were given. The following is a list of the mathematical courses, according to the January, 1912, number of L'Ensignement Mathématique: Introduction to the theory of groups, 6 hours; Astronomical observations and determinations of a position, 3 hours; The foundations of geometry, 5 hours; Vectorial analysis, 4 hours. The following three subjects were discussed: The notion of function in secondary instruction; Agreement between technical drawing and descriptive geometry; The use of certain problems of physics as applications in the teaching of mathematics. Some of these courses and subjects for discussion appear to be of a higher grade than those usually demanded by our teachers of secondary mathematics. M.

B. G. Teubner of Liepzig, Germany, has begun the publication of a series of small volumes at 20 cents each, which are intended to give an elementary exposition of various parts of elementary mathematics, and its contact with more advanced subjects. According to a recent announcement (January, 1912), the following four volumes have appeared: Numerals and number systems of ancient and modern civilized countries; The concept of number with its logical and historical significance; The Pythagorean theorem and its bearing on Fermat's theorem; and Calculus of probability with applications. The general series bears the name "Mathematische Bibliothek" and is edited by Dr. W. Leitzmann and Dr. A. Witting. It aims to enable those who are interested in mathematics in the widest sense to pursue the subject beyond what is ordinarily presented in the schools. The fact that these volumes can be sold at such a small price seems to indicate that such literature finds a large number of buyers in Germany and directs attention to the extravagant price charged in this country even for elementary text-books.
M.